

CLAIMS

WE CLAIM:

1. A middle ear prosthesis comprising:  
2 a piston adapted to extend through an oval window when implanted in a  
human ear;  
4 a pair of jaws for engaging an ossicle when implanted in a human ear;  
a spring coupled to the jaws for biasing the jaws toward one another to  
6 provide clamping pressure; and  
means for operatively connecting the jaws to the piston.
2. The middle ear prosthesis of claim 1 further comprising a swivel joint  
2 coupling the spring to the pair of jaws.
3. The middle ear prosthesis of claim 2 wherein the swivel joint is  
2 surrounded by an elastomer.
4. The middle ear prosthesis of claim 1 wherein each of the jaws  
2 comprises a body having a semi-cylindrical inner surface.

2           5.       The middle ear prosthesis of claim 4 wherein the spring comprises a  
pair of flexible support arms each operatively coupled to an associated one of the jaws.

2           6.       The middle ear prosthesis of claim 5 wherein each support arm has  
one end received in an opening in the associated jaw and another end coupled to the piston.

2           7.       The middle ear prosthesis of claim 1 wherein each support arm has  
one end surrounding the body of the associated jaw and another end coupled to the piston.

2           8.       The middle ear prosthesis of claim 1 wherein the spring is integrally  
formed between the pair of jaws and is of a flexible material different from a material of the  
jaws.

2           9.       The middle ear prosthesis of claim 8 wherein the connecting means  
comprises a wire operatively connected to one of the jaws and to the piston.

2           10.      The middle ear prosthesis of claim 9 further comprising a second wire  
connected to the other jaw so that the wires can be squeezed together to open the jaws.

2 11. The middle ear prosthesis of claim 1 further comprising a spacer to temporarily hold the jaws in an open position until implanting in a human ear is completed.

2 12. The middle ear prosthesis of claim 1 wherein the spring is of a biocompatible material.

2 13. The middle ear prosthesis of claim 1 wherein the spring is of a material selected from titanium or stainless steel.

2 14. The middle ear prosthesis of claim 1 wherein the piston is of a biocompatible material.

2 15. The middle ear prosthesis of claim 1 wherein the piston is of a material selected from titanium or PTFE.

2 16. The middle ear prosthesis of claim 1 wherein the jaws are of a bioactive material.

2 17. The middle ear prosthesis of claim 1 wherein the jaws are of hydroxylapatite.

18. A self crimping ossicular prosthesis comprising:

2 a piston adapted to extend through an oval window when implanted in a  
human ear;

4 a pair of jaws of a bioactive material each comprising a body having a semi-  
cylindrical inner surface for engaging opposite sides of an ossicle when implanted in a  
6 human ear, to anchor to the ossicle;

a pair of flexible support arms each operatively coupled to an associated one  
8 of the jaws and to the piston for biasing the jaws toward one another to provide clamping  
pressure..

19. The self crimping ossicular prosthesis of claim 18 wherein each  
2 support arm has one end received in an opening in the associated jaw to provide a swivel  
joint and another end coupled to the piston.

20. The self crimping ossicular prosthesis of claim 19 wherein the swivel  
2 joint is surrounded by an elastomer.

21. The self crimping ossicular prosthesis of claim 18 wherein each  
2 support arm has one end surrounding the body of the associated jaw and another end coupled  
to the piston.

2                   22.     The self crimping ossicular prosthesis of claim 18 further comprising  
a spacer to temporarily hold the jaws in an open position until implanting in a human ear is  
completed.

2                   23.     The self crimping ossicular prosthesis of claim 18 wherein the support  
arms are of a material selected from titanium or stainless steel.

2                   24.     The self crimping ossicular prosthesis of claim 18 wherein the piston  
is of a biocompatible material.

2                   25.     The self crimping ossicular prosthesis of claim 18 wherein the piston  
is of a material selected from titanium or PTFE.

2                   26.     The self crimping ossicular prosthesis of claim 18 wherein the jaws  
are of hydroxylapatite.

27. A self crimping ossicular prosthesis comprising:

2 a piston adapted to extend through an oval window when implanted in a  
human ear;

4 a pair of jaws of a bioactive material each comprising a body having a semi-  
cylindrical inner surface for engaging opposite sides of an ossicle when implanted in a  
6 human ear, to anchor to the ossicle;

a spring element of a flexible material, different from the pair of jaws,  
8 integrally coupled to the jaws for biasing the jaws toward one another to provide clamping  
pressure; and

10 a support arm operatively coupled to one of the jaws and to the piston.

28. The self crimping ossicular prosthesis of claim 27 wherein the jaws  
2 are spaced apart with the semi-cylindrical inner surfaces facing one another, and the spring  
element is connected between the pair of bodies to define a substantially “C” shaped  
4 attachment mechanism.

29. The self crimping ossicular prosthesis of claim 27 further comprising  
2 a second arm connected to the other jaw so that the arms can be squeezed together to open  
the jaws.

30. A self crimping ossicular prosthesis comprising:

2 a pair of jaws of a bioactive material each comprising a body having a semi-  
cylindrical inner surface for engaging opposite sides of an ossicle when implanted in a  
4 human ear, to anchor to the ossicle;

a spring element of a flexible material, different from the pair of jaws,  
6 operatively coupled to the jaws for biasing the jaws toward one another to provide clamping  
pressure; and

8 an actuator element operatively coupled to the spring element.

31. The self crimping ossicular prosthesis of claim 30 wherein the actuator  
2 element comprises a piston adapted to extend through an oval window when implanted in  
a human ear.

32. The self crimping ossicular prosthesis of claim 30 wherein the actuator  
2 element comprises a transducer element.

33. The self crimping ossicular prosthesis of claim 32 wherein the  
2 transducer element comprises one of a coil or a magnet of an electromagnetic actuator; or a  
piezoelectric element.